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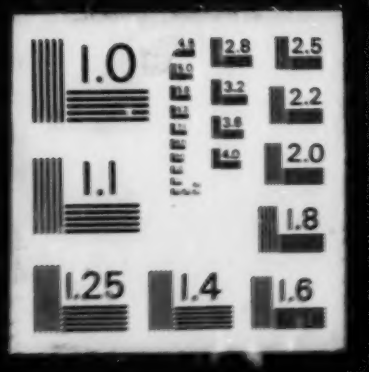

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National Eutrophication Survey, Las Vegas, Nev

Prepared for

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16. ABSTRACT
Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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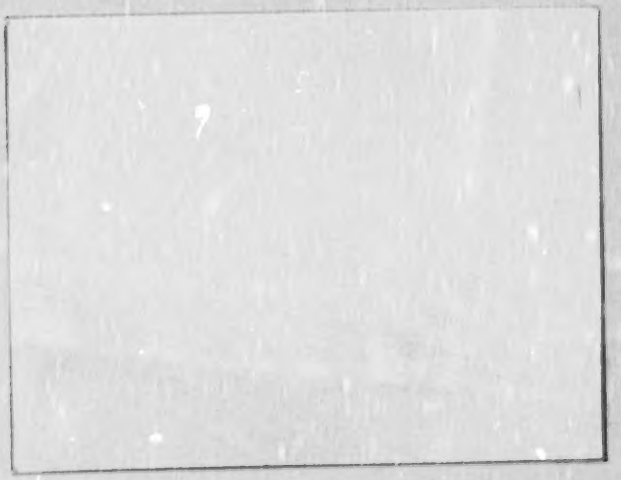

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REPORT

ON

BARKLEY LAKE

STEWART AND MONTGOMERY COUNTIES

TENNESSEE

TRIGG AND LYON COUNTIES

KENTUCKY

EPA REGION IV

WORKING PAPER No. 442

WITH THE COOPERATION OF THE

TENNESSEE DEPARTMENT OF PUBLIC HEALTH

AND THE

TENNESSEE NATIONAL GUARD

SEPTEMBER 1976

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point source discharge reduction and nonpoint source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's freshwater lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by the U.S. Environmental Protection Agency and to augment plans implementation by the states.

ACKNOWLEDGMENTS

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Tennessee Department of Public Health for professional involvement, to the Tennessee National Guard for conducting the tributary sampling phase of the Survey, and to those Tennessee wastewater treatment plant operators who provided effluent samples and flow data.

The staff of the Division of Water Quality Control, Tennessee Department of Public Health; the Division of Environmental Planning, Tennessee Valley Authority; and the Nashville District Corps of Engineers provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports and provided critiques most useful in the preparation of this Working Paper series.

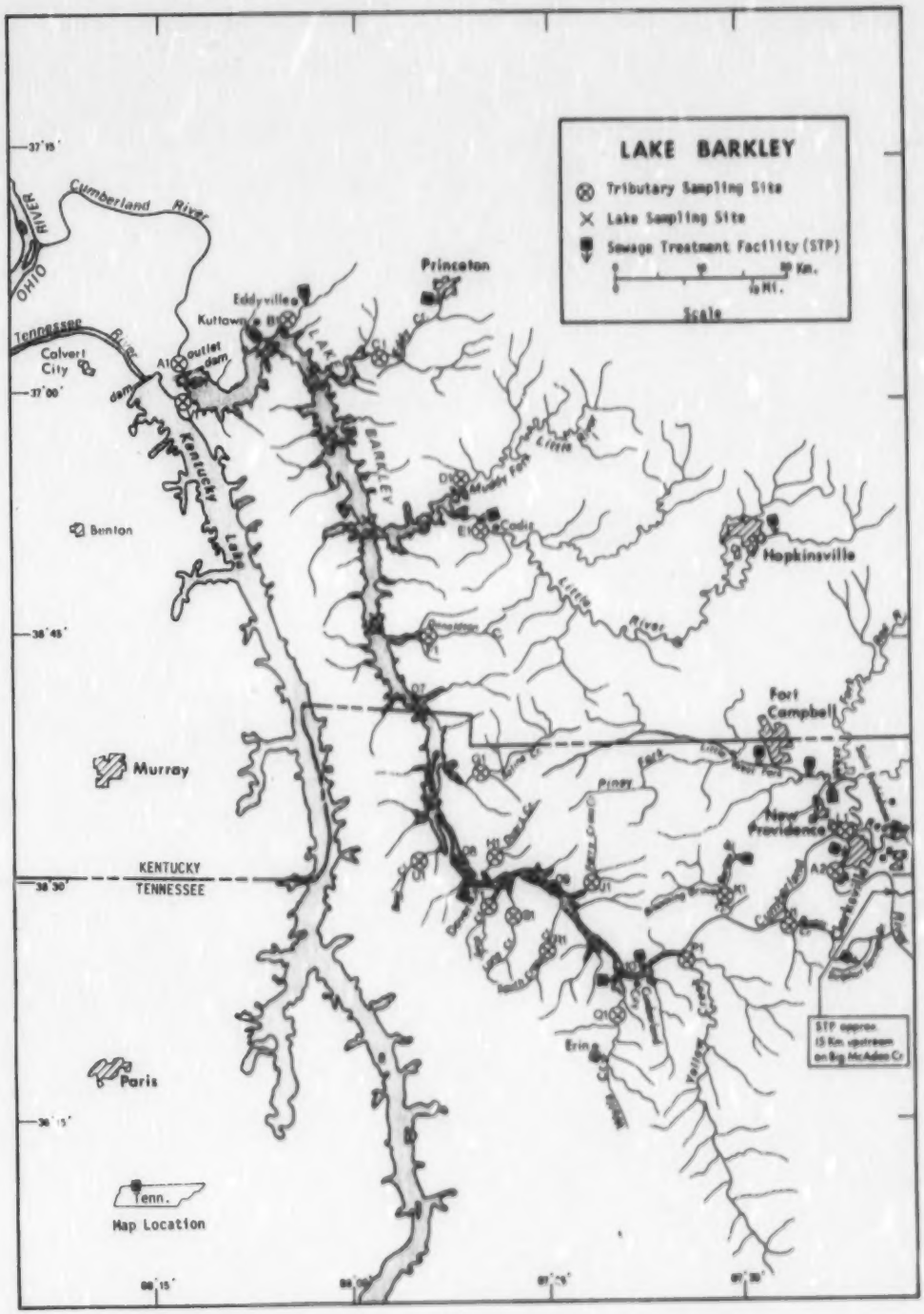
Major General William C. Smith, former Adjutant General of Tennessee, and Project Officer Colonel Wilburn C. Johnson, who directed the volunteer efforts of the Tennessee National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF TENNESSEE

LAKE NAME	COUNTY
Barkley	Stewart, Montgomery (Trigg, Lyon in KY)
Boone	Washington, Sullivan, Carter
Cheatham	Cheatham, Davidson
Cherokee	Jefferson, Hamblen, Grainger, Hawkins
Chickamauga	Hamilton, Rhea, Meigs, McMinn
Douglas	Sevier, Jefferson, Cocke
Fort Loudon	Loudon, Knox, Blount
Great Falls	White, Van Buren
Nickajack	Marion, Hamilton
Old Hickory	Sumner, Davidson, Wilson, Smith, Trousdale
Percy Priest	Davidson, Rutherford
Reelfoot	Obion
South Holston	Sullivan (Washington in VA)
Tims Ford	Moore, Franklin
Watts Bar	Rhea, Meigs, Cumberland, Roane, Loudon
Woods (Elk River)	Franklin, Coffee


LAKE BARKLEY
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility (STP)
Km.
Mi.
Scale
Cumberland River
OHIO
Tennessee River
Calvert City
Kentucky Lake
Kuttawa
Eddyville
Princeton
Hopkinsville
Fort Campbell
Murray
Benton
Paris
KENTUCKY
TENNESSEE
Tenn.
Map Location
New Providence
Erin
STP approx. 15 Km. upstream on Big McAdam Cr.

REPORT ON BARKLEY LAKE, TENNESSEE

STORET NO. 4701

I. CONCLUSIONS

A. Trophic Condition:*

Survey data indicate Barkley Lake is eutrophic, i.e., nutrient rich and highly productive. Whether such nutrient enrichment is to be considered beneficial or deleterious is determined by its actual or potential impact upon designated beneficial water uses of each lake.

Nutrient levels were high; of the 16 Tennessee lakes surveyed in 1973, 13 had less mean total phosphorus, 13 had less mean orthophosphorus, and 9 had less mean inorganic nitrogen than Barkley Lake. The mean chlorophyll a concentration was 12.9 µg/l, with a low of 2.8 µg/l in the fall and a high of 29.1 µg/l in the spring. Potential for primary productivity as measured by algal assay control yield was high, and Secchi disc visibility was low. Survey limnologists did not report any visible aquatic nuisance conditions.

*See Appendix E.

B. Rate-Limiting Nutrient:

Algal assay results indicate near colimitation by available orthophosphorus and inorganic nitrogen levels in Barkley Lake. Spikes with both nutrients produced moderate increases in assay yield. Nitrogen to phosphorus (N/P) ratios in lake data ranged from 5/1 to 11/1, suggesting that nitrogen exerted primary limitation.

C. Nutrient Controllability:

1. Point sources -

During the sampling year, the mean annual phosphorus load from point sources identified within 40 stream-km (25 miles) was estimated to be 3.4% of the total load reaching Barkley Lake. The city of Clarksville and the Ft. Campbell Military Reservation were each estimated to contribute 1.2% of the total load. Fifteen other smaller municipal plants contributed the remaining load.

Loading calculations based upon available nutrient concentrations and flow data yield a net export of both nitrogen and phosphorus from Barkley Lake. This apparent export could be due to the absence of the loading data for treated industrial discharges at Dover, to other undetected municipal or industrial sources discharging to the lake, and/or failure to accurately depict loadings from a number of the known sewage treatment plants with available estimation means.

As it is, the measured phosphorus surface loading of 17.19 g $P/m^2/yr$ is seven times higher than the "eutrophic" load proposed by Vollenweider (1975). Although Vollenweider's model may not be applicable to lakes with short hydraulic retention times (16 days for Barkley Lake), elimination of the known point sources directly impacting Barkley Lake would not reduce phosphorus loading sufficiently to cause a significant improvement in the lake's trophic condition.

2. Nonpoint sources -

The mean annual phosphorus load not attributable to nearby point sources was about 96.6% of the total reaching the lake. Measured tributaries accounted for approximately 96.0% of the total phosphorus load, and the ungaged drainage area was estimated to have contributed 0.5%.

The Cumberland River contributed 74.1% of this "nonpoint" load to Barkley Lake. Studies of upstream Cumberland River reservoirs (National Eutrophication Survey Working Paper No. 444) reveal a number of large point sources not considered in the nutrient budget to Barkley Lake, the most significant of these from the city of Nashville. An evaluation of the nutrient control requirements for the upstream Cumberland River reservoirs is needed before a nutrient budget or control strategy can be defined for Barkley Lake.

Nonpoint nutrient exports for Unnamed Stream, B(1), Eddy Creek, C(1), and Little River, E(1), were inordinately higher than those observed for the other tributaries entering Barkley Lake (see Section IV-D). For example, if the mean nutrient loads, in kg/km^2/yr, of representative unimpacted tributaries (see page 19) were multiplied by the drainage area of Unnamed Stream, B(1), an estimated annual phosphorus loading of 110 kg P/yr for tributary B(1) would be obtained rather than the observed value of 45,560 kg P/yr. This discrepancy may be attributable to unknown point sources impacting the tributary or to sampling error. Additional sampling and analyses of the tributary watershed are necessary to determine if those excessive loading values are real, and if so, how to account for them.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS

Lake and drainage basin characteristics are itemized below. Lake surface area, volume, and hydraulic retention time were provided by the Nashville District Corps of Engineers; lake mean and maximum depths were provided by the Tennessee Department of Public Health, Division of Water Quality Control; tributary flow data and drainage area were provided by the Tennessee District Office of the U.S. Geological Survey (USGS). Outlet drainage area includes the lake surface area. Mean hydraulic retention time was obtained by dividing the lake volume by mean flow of the outlet. Tributary drainage areas plus the lake surface area do not equal the outlet drainage area probably because of differences in pool elevation used by the different sources in their calculations. Precipitation values are estimated by methods as outlined in National Eutrophication Survey (NES) Working Paper No. 175. A table of metric/English conversions is included in Appendix A.

A. Lake Morphometry:

1. Surface area: 234.40 km^2.
2. Mean depth: 4.6 meters.
3. Maximum depth: 21.0 meters.
4. Volume: 1,071.900 x 10^6 m^3.
5. Mean hydraulic retention time: 16 days.

B. Tributary and Outlet (see Appendix B for flow data):

1. Tributaries -

Name	Drainage area(km^2)	Mean Flow (m^3/sec)
A(2) Cumberland River	37,389.2	620.04
B(1) Unnamed Stream	8.4	0.11
C(1) Eddy Creek	193.0	2.65
D(1) Muddy Fork Little River	339.3	4.93
E(1) Little River	1,098.2	16.02
F(1) Donaldson Creek	45.3	0.66
G(1) Saline Creek	112.4	1.64
H(1) Dyers Creek	46.9	0.68
J(1) Ferry Cross Creek	50.5	0.71
K(1) Blooming Grove Creek	79.0	1.11
L(1) Red River	3,768.4	48.02
N(1) Budds Creek	59.8	0.84
P(1) Yellow Creek	432.5	6.07
Q(1) Wells Creek	144.3	2.02
R(1) South Cross Creek	34.7	0.49
S(1) Long Creek	48.7	0.68
T(1) Lick Creek	35.7	0.50
U(1) Bear Creek	42.7	0.60
V(1) Canal	-	164.77
Minor tributaries and immediate drainage -	1,414.1	20.30
Totals	45,342.6	892.84

2. Outlet -

A(1) Cumberland River	45,578.8	984.95

C. Precipitation:

1. Year of sampling: 136.2 cm.
2. Mean annual: 120.1 cm.

III. LAKE WATER QUALITY SUMMARY

Barkley Lake was sampled three times during the open-water season of 1973 by means of a pontoon-equipped Huey helicopter. The first time, samples for physical and chemical parameters were collected from 10 stations on the lake and from a number of depths at each station (see map, page v). The second time, only Stations 1, 2, 4, 6, 8, and 10 were sampled. The third time, only Stations 1, 3, 5, 7, and 9 were sampled. During each visit, depth-integrated samples were collected from each sampling station for chlorophyll a analysis and phytoplankton identification and enumeration. During the first visit, three 18.9-liter depth-integrated samples were composited for algal assays. Maximum depths (expressed in meters) sampled are listed below:

Station Number	Maximum Depth
1	21.3
2	19.8
3	19.5
4	20.7
5	18.0
6.	16.8
7	15.2
8	15.2
9	16.8
10	10.7

For a more detailed explanation of NES methods, see NES Working Paper No. 175.

The results obtained are presented in full in Appendix C and are summarized in III-A for waters at the surface and at the maximum depth for each site. Results of the phytoplankton counts and chlorophyll a determinations are included in III-B. Results of the limiting nutrient study are presented in III-C.

LAKE BARKLEY
STORET CODE 4701

PHYSICAL AND CHEMICAL CHARACTERISTICS

PARAMETER	(5/16/73) S*** = 10 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	(8/14/73) S*** = 6 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	(10/20/73) S*** = 5 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)
TEMPERATURE (DEG CENT)												
0.-1.5 M DEPTH	14	17.3- 32.0	22.0	0.0- 1.5	12	18.0- 36.0	27.5	0.0- 1.5	9	20.0- 29.0	24.5	0.0- 1.5
MAX DEPTH**	10	18.1- 20.0	19.1	0.0- 20.7	6	24.9- 27.7	25.8	10.7- 21.3	5	21.1- 24.1	21.4	12.2- 18.0
DISSOLVED OXYGEN (MG/L)												
0.-1.5 M DEPTH	3	9.3- 10.8	9.5	1.2- 1.5	6	6.0- 7.0	6.4	1.5- 1.5	3	5.8- 6.8	6.4	1.5- 1.5
MAX DEPTH**	9	8.9- 12.7	9.6	9.1- 20.7	6	5.9- 6.3	6.2	10.7- 21.3	5	5.0- 7.2	5.8	12.2- 18.0
CONDUCTIVITY (UMHOS)												
0.-1.5 M DEPTH	14	192.- 225.	220.	0.0- 1.5	12	163.- 178.	172.	0.0- 1.5	9	166.- 184.	172.	0.0- 1.5
MAX DEPTH**	10	199.- 220.	214.	0.0- 20.7	6	164.- 174.	171.	10.7- 21.3	5	165.- 182.	172.	12.2- 18.0
PH (STANDARD UNITS)												
0.-1.5 M DEPTH	14	7.7- 8.5	8.0	0.0- 1.5	12	7.1- 8.3	7.2	0.0- 1.5	9	7.2- 7.4	7.3	0.0- 1.5
MAX DEPTH**	10	7.7- 8.3	7.8	0.0- 20.7	6	7.1- 7.7	7.2	10.7- 21.3	5	7.1- 7.8	7.3	12.2- 18.0
TOTAL ALKALINITY (MG/L)												
0.-1.5 M DEPTH	14	72.- 98.	85.	0.0- 1.5	12	61.- 67.	65.	0.0- 1.5	9	54.- 62.	57.	0.0- 1.5
MAX DEPTH**	10	72.- 98.	85.	0.0- 20.7	6	62.- 67.	65.	10.7- 21.3	5	54.- 60.	56.	12.2- 18.0
TOTAL P (MG/L)												
0.-1.5 M DEPTH	14	0.085-0.155	0.124	0.0- 1.5	12	0.086-0.164	0.126	0.0- 1.5	9	0.105-0.162	0.128	0.0- 1.5
MAX DEPTH**	10	0.118-0.300	0.135	0.0- 20.7	6	0.132-0.167	0.149	10.7- 21.3	5	0.135-0.174	0.149	12.2- 18.0
DISSOLVED ORTHO P (MG/L)												
0.-1.5 M DEPTH	14	0.027-0.054	0.043	0.0- 1.5	12	0.031-0.083	0.059	0.0- 1.5	9	0.053-0.101	0.070	0.0- 1.5
MAX DEPTH**	10	0.030-0.050	0.041	0.0- 20.7	6	0.033-0.070	0.045	10.7- 21.3	5	0.045-0.089	0.062	12.2- 18.0
NO2+NO3 (MG/L)												
0.-1.5 M DEPTH	14	0.290-0.460	0.430	0.0- 1.5	12	0.140-0.450	0.355	0.0- 1.5	9	0.340-0.600	0.420	0.0- 1.5
MAX DEPTH**	10	0.260-0.510	0.430	0.0- 20.7	6	0.150-0.460	0.355	10.7- 21.3	5	0.360-0.530	0.420	12.2- 18.0
AMMONIA (MG/L)												
0.-1.5 M DEPTH	14	0.040-0.070	0.050	0.0- 1.5	12	0.070-0.170	0.135	0.0- 1.5	9	0.040-0.150	0.050	0.0- 1.5
MAX DEPTH**	10	0.030-0.060	0.055	0.0- 20.7	6	0.100-0.160	0.130	10.7- 21.3	5	0.050-0.150	0.050	12.2- 18.0
KJELDAHL N (MG/L)												
0.-1.5 M DEPTH	14	0.200-0.600	0.400	0.0- 1.5	12	0.200-0.800	0.450	0.0- 1.5	9	0.200-0.600	0.300	0.0- 1.5
MAX DEPTH**	10	0.200-0.500	0.300	0.0- 20.7	6	0.200-0.400	0.400	10.7- 21.3	5	0.200-0.400	0.200	12.2- 18.0
SECCHI DISC (METERS)												
	0	***** - *****	*****		0	***** - *****	*****		0	***** - *****	*****	

* N = NO. OF SAMPLES
** MAXIMUM DEPTH SAMPLED AT EACH SITE
*** S = NO. OF SITES SAMPLED ON THIS DATE

B. Biological Characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera		Algal Units per ml
05/16-17/73	1.	Melosira	12,364
	2.	Flagellates	1,273
	3.	Cyclotella	864
	4.	Stephanodiscus	182
	5.	Dinoflagellates	136
		Other genera	378
		Total	15,197
08/14/73	1.	Melosira	3,700
	2.	Oscillatoria	727
	3.	Cyclotella	341
	4.	Raphidiopsis	318
	5.	Cryptomonas	227
		Other genera	1,044
		Total	6,357
10/20/73	1.	Melosira	1,713
	2.	Flagellates	1,022
	3.	Stephanodiscus	299
	4.	Cryptomonas	126
	5.	Oscillatoria	94
		Other genera	487
		Total	3,741

2. Chlorophyll *a* -

Sampling Date	Station Number	Chlorophyll *a* (micrograms/liter)
05/16/73	1	27.3
	2	29.1
	3	28.4
	4	13.0
	5	18.5
05/17/73	6	17.0
	7	12.4
	8	10.0
	9	9.4
	10	10.3
08/14/73	1	17.1
	2	23.3
	3	---
	4	13.9
	5	---
	6	5.2
	7	---
	8	3.2
	9	---
	10	4.9
10/20/73	1	4.5
	2	---
	3	9.7
	4	---
	5	5.5
	6	---
	7	2.8
	8	---
	9	5.0
	10	---

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc.(mg/l)	Inorganic N Conc.(mg/l)	Maximum Yield (mg/l-dry wt.)
Stations 1, 2, 3, and 4;			
Control	M	0.348	8.7
0.05 P	M	0.348	10.1
0.05 P + 1.0 N	M	1.348	23.3
1.00 N	M	1.348	13.8
Stations 5, 6, 7, and 8;			
Control	0.044	0.628	7.1
0.05 P	0.094	0.628	10.3
0.05 P + 1.0 N	0.094	1.628	19.0
1.00 N	0.044	1.628	12.3
Stations 9 and 10;			
Control	0.032	0.604	3.3
0.05 P	0.082	0.604	5.0
0.05 P + 1.0 N	0.082	1.604	8.0
1.00 N	0.032	1.604	5.0

2. Filtered and nutrient spiked -

Spike (mg/l)	Ortho P Conc.(mg/l)	Inorganic N Conc.(mg/l)	Maximum Yield (mg/l-dry wt.)
Stations 5, 6, 7, and 8;			
Control	0.035	0.435	8.4
0.05 P	0.085	0.435	10.9
0.05 P + 1.0 N	0.085	1.435	29.1
1.00 N	0.035	1.435	9.4

M = missing.

3. Discussion -

The control yields of the assay alga, Selenastrum capricornutum, indicate that the potential for primary production in Barkley Lake was high at the time of sampling. Moderate response accompanied the addition of both nitrogen and phosphorus alone, suggesting the lake is very nearly colimited by the two nutrients. The simultaneous addition of nitrogen and phosphorus spikes resulted in maximum yield.

Mean lake N/P ratios of 11/1, 8/1, and 8/1 for the first, second, and third samplings, respectively, indicate nitrogen was the primary limiting nutrient at the time of sampling. A ratio of 14/1 or more is generally necessary to ascribe clear-cut phosphorus limitation.

IV. NUTRIENT LOADINGS
(See Appendix D for data)

For the determination of nutrient loadings, the Tennessee National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff month of February when two samples were collected. Sampling was begun in April 1973 and was completed in March 1974.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Tennessee District Office of the USGS for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries, except Barkley Canal (4701 V1), were determined by using a modification of a USGS computer program for calculating stream loadings. Nutrient loading estimates for Barkley Canal (Station V1) were derived by multiplying the mean normalized flow by the mean annual concentration. The mean annual concentration was obtained from the values observed at Station 2104 A1 (Kentucky Lake) and Station 4701 V1 (Barkley Lake). Concentrations for each sampling date are shown in Appendix D. Nutrient loads indicated for tributaries are those measured minus point source loads, if any.

Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of USGS) were estimated by using the means of the nutrient loads, in $kg/km^2/yr$, for Ferry Cross Creek, Budds Creek, Yellow Creek, South Cross Creek, and Long Creek at Stations J(1), N(1), P(1), R(1), and S(1), and multiplying the means by the "ZZ" area in km^2.

The operators of the Princeton, Cadiz, and Kuttawa wastewater treatment plants provided monthly effluent samples and corresponding flow data. Nutrient loads for the cities of Eddyville, Cumberland City, Clarksville (three plants), Hopkinsville, Ft. Campbell, Springfield, Erin, and Dover wastewater treatment plants were estimated at 1.134 kg P and 2.401 kg N/capita/yr. Nutrient loads for the Montgomery Elementary and Central High Schools, the St. Bethlehem Elementary School, and Woodlawn Elementary School were estimated at 0.567 kg P and 1.701 kg N/capita/yr (covers 180 days).

A. Waste Sources:

1. Known municipal -

Name*	Population Served*	Treatment*	Mean Flow ($m^3/d \times 10^3$)	Receiving Water
Eddyville (Kentucky)	900	1.	0.341**	Hammond Creek
Princeton (Kentucky)	5,620	1.	2.123	Eddy Creek
Cadiz (Kentucky)	1,980	2.	0.364	Little River
Kuttawa (Kentucky)	635	2.	0.304	Poplar Creek
Cumberland City	850	3.	0.322**	Cumberland River
Main (Clarksville)	28,500	2.	10.787**	Cumberland River
Providence (Clarksville)	9,000	1.	3.406**	Ringgold Creek
Edgoten (Clarksville)	4,000	2.	1.514**	Little West Fork
Dover	1,650	2.	0.624**	Cumberland River
Hopkinsville (Kentucky)	23,000	1.	8.706**	Little River
Ft. Campbell Military Reservation (Kentucky)	42,000	4.	15.897**	Little West Fork Creek
Springfield	10,500	1.	6.662	Sulfur Fork Creek/ Red River
Erin	1,200	5.	0.651	Wells Creek
Montgomery Elementary School	895	6.	0.339**	Big McAdoo Creek
Montgomery Central High School	936	6.	0.354**	Sulfur Spring Creek
St. Bethlehem Elementary School	776	6.	0.294**	Red River
Woodlawn Elementary School	701	6.	0.265**	Barter Br[illegible]/ Blooming Grove Creek

2. Known industrial -

Name	Product	Treatment	Mean Flow ($m^3/d \times 10^3$)	Receiving Water
Dover	Aluminum	2.	unknown	Cumberland River
Main (Clarksville)	Meat Packing wastes from Frosty Morn plant	2.	3.028	Cumberland River

Key:
1. Trickling filter
2. Activated sludge
3. Stabilization pond
4. Tertiary
5. Contact aerators
6. Extended aeration

*Treatment plant questionnaires, U.S.EPA, 1971, and/or Tennessee Department of Public Health, 1975.
**Estimated at 0.3785 m^3/capita/day.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/yr	% of total
a. Tributaries (nonpoint load) -		
A(2) Cumberland River	2,984,155	74.1
B(1) Unnamed Stream	45,560	1.1
C(1) Eddy Creek	22,880	0.6
D(1) Muddy Fork Little River	10,240	0.3
E(1) Little River	88,605	2.2
F(1) Donaldson Creek	350	<0.1
G(1) Saline Creek	3,400	0.1
H(1) Dyers Creek	260	<0.1
J(1) Ferry Cross Creek	345	<0.1
K(1) Blooming Grove Creek	2,060	0.1
L(1) Red River	161,490	4.0
N(1) Budds Creek	845	<0.1
P(1) Yellow Creek	11,075	0.3
Q(1) Wells Creek	2,200	0.1
R(1) South Cross Creek	345	<0.1
S(1) Long Creek	510	<0.1
T(1) Lick Creek	325	<0.1
U(1) Bear Creek	190	<0.1
V(1) Canal	519,620	12.9
b. Minor tributaries and immediate drainage (nonpoint load) -	18,385	0.5
c. Known municipal STP's -		
Eddyville (Kentucky)	1,020	<0.1
Princeton (Kentucky)	8,095	0.2
Cadiz (Kentucky)	2,130	0.1
Kuttawa (Kentucky)	1,530	<0.1
Cumberland City (Kentucky)	965	<0.1
Main (Clarksville)	32,320	0.8
Providence (Clarksville)	10,205	0.3
Edgoten (Clarksville)	4,535	0.1
Dover	1,870	<0.1
Hopkinsville	26,080	0.6
Ft. Campbell	47,630	1.2
Springfield	11,905	0.3
Erin	1,360	<0.1
Montgomery Elementary School	505	<0.1
Montgomery Central High School	530	<0.1
St. Bethlehem Elementary School	440	<0.1
Woodlawn Elementary School	395	<0.1
d. Septic tanks* -	85	<0.1
e. Known industrial -		
Dover	unknown	
Main (Clarksville)	unknown	
f. Direct precipitation** -	4,100	0.1
Totals	4,028,540	100.0
2. Output - A(1) Cumberland River	4,209,050	
3. Net annual P export*** -	180,510	

*Estimate based on 300 lakeside residences.
**Estimated (see NES Working Paper No. 175).
***Calculated export probably due to unknown nutrient sources and/or nonrepresentative sampling.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/yr	% of total
a. Tributaries (nonpoint load) -		
A(2) Cumberland River	16,819,435	56.1
B(1) Unnamed Stream	67,020	0.2
C(1) Eddy Creek	191,050	0.6
D(1) Muddy Fork Little River	331,875	1.1
E(1) Little River	1,387,600	4.6
F(1) Donaldson Creek	16,385	0.1
G(1) Saline Creek	56,450	0.2
H(1) Dyers Creek	16,485	0.1
J(1) Ferry Cross Creek	18,845	0.1
K(1) Blooming Grove Creek	27,455	0.1
L(1) Red River	3,282,050	11.0
N(1) Budds Creek	17,340	0.1
P(1) Yellow Creek	139,915	0.5
Q(1) Wells Creek	36,835	0.1
R(1) South Cross Creek	9,450	<0.1
S(1) Long Creek	12,840	<0.1
T(1) Lick Creek	6,795	<0.1
U(1) Bear Creek	23,320	0.1
V(1) Canal	6,365,330	21.4
b. Minor tributaries and immediate drainage (nonpoint load) -	431,300	1.4
c. Known municipal STP's -		
Eddyville (Kentucky)	3,060	<0.1
Princeton (Kentucky)	14,055	<0.1
Cadiz (Kentucky)	1,830	<0.1
Kuttawa (Kentucky)	2,830	<0.1
Cumberland City (Kentucky)	2,890	<0.1
Main (Clarksville)	96,930	0.3
Providence (Clarksville)	30,610	0.1
Edgoten (Clarksville	13,605	0.1
Dover	5,610	<0.1
Hopkinsville	78,225	0.3
Ft. Campbell	142,840	0.5
Springfield	35,710	0.1
Erin	4,080	<0.1
Montgomery Elementary School	1,520	<0.1
Montgomery Central High School	1,590	<0.1
St. Bethlehem Elementary School	1,320	<0.1
Woodlawn Elementary School	1,190	<0.1
d. Septic tanks* -	3,195	<0.1
e. Known industrial -		
Dover	unknown	
Main (Clarksville)	unknown	
f. Direct precipitation** -	253,060	0.8
Totals	29,951,925	100.0
2. Output - A(1) Cumberland River	32,674,930	
3. Net annual N export*** -	2,723,005	

*Estimate based on 300 lakeside residences.
**Estimated (see NES Working Paper No. 175).
***Calculated export probably due to unknown nutrient sources and/or nonrepresentative sampling.

D. Mean Annual Nonpoint Nutrient Export by Subdrainage Area:

Tributary	kg P/km^2/yr	kg N/km^2/yr
A(2) Cumberland River	80	450
B(1) Unnamed Stream	5,424*	7,979*
C(1) Eddy Creek	119	990
D(1) Muddy Fork Little River	30	978
E(1) Little River	81	1,264
F(1) Donaldson Creek	8	362
G(1) Saline Creek	30	502
H(1) Dyers Creek	6	351
J(1) Ferry Cross Creek	7	373
K(1) Blooming Grove Creek	26	348
L(1) Red River	43	871
N(1) Budds Creek	14	290
P(1) Yellow Creek	26	324
Q(1) Wells Creek	15	255
R(1) South Cross Creek	10	272
S(1) Long Creek	10	266
T(1) Lick Creek	9	190
U(1) Bear Creek	4	546

*Background levels greatly inflated, see text.

E. Yearly Loadings:

In the following table, the existing phosphorus annual loading is compared to the relationship proposed by Vollenweider (1975). Essentially, his "eutrophic" loading is that at which the receiving waters would become eutrophic or remain eutrophic; his "oligotrophic" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A "mesotrophic" loading would be considered one between "eutrophic" and "oligotrophic".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times or in which light penetration is severely restricted from high concentrations of suspended solids in the surface waters.

	Total Yearly Phosphorus Loading ($g/m^2/yr$)
Estimated loading for Barkley Lake	17.19
Vollenweider's "eutrophic" loading	2.02
Vollenweider's "oligotrophic" loading	1.01

V. LITERATURE REVIEWED

Tennessee Department of Public Health. 1975. "Water Quality Management Plan for the Lower Cumberland River Basin", preliminary draft, Division of Water Quality Control, Nashville, Tennessee.

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U.S. Environmental Protection Agency. 1975. National Eutrophication Survey Methods 1973-1976. Working Paper No. 175. National Environmental Research Center, Las Vegas, Nevada, and Pacific Northwest Environmental Research Laboratory, Corvallis, Oregon.

U.S. Environmental Protection Agency. 1976. Report on Cheatham Reservoir, Old Hickory Reservoir, and J. Percy Priest Reservoir. Working Paper No. 444. Environmental Monitoring and Support Laboratory - Las Vegas, Nevada, and Corvallis Environmental Research Laboratory - Corvallis, Oregon.

Vollenweider, R. A. 1975. Input-Output Models With Special Reference to the Phosphorus Loading Concept in Limnology. Schweiz. Z. Hydrol. 37:53-84.

VI. APPENDICES

APPENDIX A

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX B

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4701 LAKE BARKLEY

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 45578.8

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
4701A1	45578.8	1449.82	1512.12	1529.11	1084.54	1325.23	671.11	659.78	719.25	515.37	498.38	702.26	1172.32	984.95
4701A2	37389.2	815.53	1050.55	1226.12	1112.85	699.43	390.77	345.47	325.64	255.98	237.30	362.46	648.46	620.04
4701B1	8.4	0.164	0.244	0.311	0.167	0.119	0.051	0.048	0.020	0.014	0.011	0.057	0.125	0.110
4701C1	193.0	4.36	5.89	6.99	4.08	2.66	1.36	1.16	0.59	0.42	0.28	1.33	2.92	2.65
4701D1	339.3	8.13	10.25	12.23	7.42	5.64	2.83	2.18	1.42	1.33	0.62	2.58	4.90	4.93
4701E1	1098.2	26.28	33.22	39.64	24.01	18.26	9.20	7.08	4.59	4.33	2.01	8.33	16.34	16.02
4701F1	45.3	1.076	1.359	1.642	0.991	0.765	0.368	0.283	0.190	0.178	0.082	0.340	0.680	0.659
4701G1	112.4	2.69	3.40	4.05	2.46	1.87	0.95	0.72	0.47	0.44	0.21	0.85	1.67	1.64
4701H1	46.9	1.121	1.419	1.691	1.025	0.779	0.394	0.303	0.195	0.185	0.087	0.354	0.697	0.684
4701J1	50.5	0.78	1.30	1.84	1.18	0.86	0.40	0.34	0.30	0.17	0.14	0.41	0.81	0.71
4701K1	79.0	1.23	2.04	2.99	1.85	1.35	0.63	0.53	0.48	0.27	0.22	0.64	1.27	1.11
4701L1	3768.4	59.47	99.39	130.26	107.04	52.67	27.13	18.55	11.95	6.60	6.99	11.13	48.70	48.02
4701N1	59.8	0.93	1.54	2.18	1.40	1.02	0.48	0.40	0.36	0.20	0.17	0.48	0.96	0.84
4701P1	432.5	6.71	11.16	15.74	10.11	7.36	3.45	2.89	2.60	1.47	1.23	3.51	6.94	6.07
4701Q1	144.3	2.24	3.71	5.24	3.37	2.46	1.15	0.96	0.87	0.49	0.41	1.17	2.32	2.02
4701R1	34.7	0.538	0.895	1.263	0.813	0.592	0.277	0.231	0.209	0.118	0.099	0.281	0.558	0.487
4701S1	48.2	0.75	1.24	1.75	1.13	0.82	0.39	0.32	0.29	0.16	0.14	0.39	0.77	0.68
4701T1	35.7	0.56	0.92	1.30	0.84	0.61	0.29	0.24	0.21	0.12	0.10	0.29	0.57	0.50
4701U1	42.7	0.66	1.10	1.55	1.00	0.73	0.34	0.29	0.26	0.14	0.12	0.35	0.69	0.60
4701V1	0.0	339.802	226.252	218.323	-35.113	22.512	67.960	113.551	154.327	126.293	198.218	280.053	263.913	164.769
4701ZZ	1414.1	27.89	39.64	51.54	32.00	23.84	11.61	9.29	7.11	5.27	3.40	11.16	22.00	20.30

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 45578.8
SUM OF SUB-DRAINAGE AREAS = 45342.7

TOTAL FLOW IN = 10749.79
TOTAL FLOW OUT = 11839.26

NOTE *** SITE 4701V1=2104A1--NEGATIVE NUMBERS ARE FLOWS OUT OF THE LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4701A1	3	73	2223.722						
	4	73	1853.338	15	1999.169				
	5	73	1757.910	5	1684.852				
	6	73	1802.084	3	1798.120	30	1166.654		
	7	73	1277.373						
	8	73	828.551	26	690.931				
	9	73	461.281	18	311.485				
	10	73	368.402	21	170.751				
	11	73	995.620	3	1098.694				
	12	73	2049.856	17	1755.645				
	1	74	3055.388	26	2358.793				
	2	74	2854.338	2	2823.190	17	2208.714		
	3	74	1416.692	1	1520.615	17	1039.228		

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4701 LAKE BARKLEY

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4701A2	4	73	1466.812	14	1192.139				
	5	73	1254.436	6	1010.911				
	6	73	1172.317	1	934.456				
	7	73	756.060	1	1019.406				
	8	73	470.060	26	404.931				
	9	73	226.025	18	149.513				
	10	73	276.939	20	251.170				
	11	73	676.772	2	475.723				
	12	73	1291.248	18	741.901				
	1	74	2916.635	26	2480.556				
	2	74	2021.823	3	2738.239	16	1622.555		
	3	74	1214.793	3	733.406	16	988.258		
4701B1	3	73	0.368						
	4	73	0.340	14	0.142				
	5	73	0.221	5	0.280				
	6	73	0.096	3	0.102	30	0.096		
	7	73	0.054						
	8	73	0.017	26	0.008				
	9	73	0.006	18	0.006				
	10	73	0.011	21	0.008				
	11	73	0.207	3	0.020				
	12	73	0.193	17	0.079				
	1	74	0.453	26	0.212				
	2	74	0.210	3	0.453	17	0.113		
	3	74	0.224	1	0.150	17	0.311		
4701C1	3	73	8.042						
	4	73	8.438	15	3.285				
	5	73	4.927	5	6.258				
	6	73	2.577	3	2.747	30	2.549		
	7	73	1.303						
	8	73	0.539	26	0.311				
	9	73	0.193	18	0.173				
	10	73	0.311	21	0.227				
	11	73	4.870	3	0.425				
	12	73	4.502	17	1.869				
	1	74	12.346	26	5.805				
	2	74	5.012	2	7.136	17	2.718		
	3	74	5.012						
4701D1	3	73	14.073						
	4	73	15.348	14	6.456				
	5	73	10.421	5	13.224				
	6	73	5.359	3	5.720	30	5.295		
	7	73	2.435						
	8	73	1.303	26	0.736				
	9	73	0.595	18	0.566				
	10	73	0.680	21	0.481				
	11	73	9.430	3	0.850				
	12	73	7.759	17	3.200				
	1	74	23.022	26	10.845				
	2	74	8.835	2	12.544	17	4.786		
	3	74	8.750	1	5.805	17	12.374		

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 03/13/76

LAKE CODE 4701 LAKE BARKLEY

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4701E1	3	73	45.307						
	4	73	49.838	14	20.926				
	5	73	33.697	5	42.758				
	6	73	17.387	3	18.604	30	17.217		
	7	73	7.929						
	8	73	4.191	26	2.379				
	9	73	1.982	18	1.784				
	10	73	2.180	21	1.586				
	11	73	30.582	3	2.747				
	12	73	25.202	17	10.421				
	1	74	74.473	26	35.113				
	2	74	28.600	2	40.776	17	15.574		
	3	74	28.317	1	18.859	17	40.210		
4701F1	3	73	1.897						
	4	73	2.039	14	0.850				
	5	73	1.416	5	1.812				
	6	73	0.708	3	0.765	30	0.708		
	7	73	0.311						
	8	73	0.173	26	0.099				
	9	73	0.079	18	0.071				
	10	73	0.088	21	0.062				
	11	73	1.246	3	0.113				
	12	73	1.048	17	0.425				
	1	74	3.058	26	1.444				
	2	74	1.161	2	1.642	17	0.623		
	3	74	1.189	1	0.793	17	1.671		
4701G1	4	73	5.097	14	2.138				
	5	73	3.455	6	3.766				
	6	73	1.781	2	2.149	30	17.556		
	7	73	0.810						
	8	73	0.430	25	0.246				
	9	73	0.195	18	0.184				
	10	73	20.043	20	0.173				
	11	73	3.115	3	0.283				
	12	73	2.580	17	1.070				
	1	74	7.617	26	3.596				
	2	74	2.945	3	6.343	15	1.758		
	3	74	2.888	3	1.733	16	3.908		
4701H1	4	73	2.121	14	0.892				
	5	73	1.444	6	1.569				
	6	73	0.742	2	0.898	30	0.733		
	7	73	0.337						
	8	73	0.178	25	0.102				
	9	73	0.082	18	0.076				
	10	73	0.093	20	0.071				
	11	73	1.303	3	0.119				
	12	73	1.076	17	0.445				
	1	74	3.171	26	1.498				
	2	74	1.226	3	2.645	15	0.733		
	3	74	1.209	3	0.722	16	1.625		

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4701 LAKE BARKLEY

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4701J1	4	73	1.756	14	0.883				
	5	73	1.325	6	1.552				
	6	73	0.541	2	0.807	30	0.309		
	7	73	0.221						
	8	73	0.164	25	0.348				
	9	73	0.176	18	0.181				
	10	73	0.161	20	0.150				
	11	73	1.795	2	0.187				
	12	73	0.844	17	0.286				
	1	74	3.823	26	1.175				
	2	74	1.000	3	1.390	15	0.779		
	3	74	1.348	3	0.943	16	1.186		
4701K1	5	73	2.073						
	6	73	0.847	30	0.484				
	7	73	0.345						
	8	73	0.261	25	0.544				
	9	73	0.278	18	0.286				
	10	73	0.249	20	0.232				
	11	73	2.806	2	0.294				
	12	73	1.322	17	0.450				
	1	74	5.975	26	1.841				
	2	74	1.563	3	2.178	15	1.218		
	3	74	2.107						
4701L1	4	73	139.036	14	75.323				
	5	73	96.560	6	119.497				
	6	73	42.192	1	62.297				
	7	73	28.600	26	67.677				
	8	73	17.726	25	9.883				
	9	73	7.815	18	7.815				
	10	73	5.777	20	4.531				
	11	73	89.764	3	6.994				
	12	73	71.358	17	26.788				
	1	74	263.630	26	107.604				
	2	74	94.861	3	167.636	16	56.917		
	3	74	86.083	3	58.899	16	72.491		
4701N1	4	73	2.081	14	1.048				
	5	73	1.569	6	1.838				
	6	73	0.640	2	0.954				
	7	73	0.261	1	0.345				
	8	73	0.195	25	0.413				
	9	73	0.210	17	0.224				
	10	73	0.190	20	0.176				
	11	73	2.118	2	0.224				
	12	73	1.000	18	0.328				
	1	74	4.531	26	1.393				
	2	74	1.184	3	1.648				
	3	74	1.597	3	1.119	16	1.399		

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 04/13/76

LAKE CODE 4701 LAKE BARKLEY

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
470121	4	73	15.036	14	7.561				
	5	73	11.355	6	13.281				
	6	73	4.644	2	6.909				
	7	73	1.892	1	2.596				
	8	73	1.419	25	2.973				
	9	73	1.512	17	1.608				
	10	73	1.371	20	1.277				
	11	73	15.319	2	1.608				
	12	73	7.249	18	2.364				
	1	74	32.848	27	10.109				
	2	74	8.552	3	11.921	15	6.654		
	3	74	11.525	3	8.399	16	10.109		
470131	4	73	5.012	14	2.523				
	5	73	3.794	6	4.446				
	6	73	1.546	2	2.302				
	7	73	0.631	1	0.835				
	8	73	0.473	25	0.994				
	9	73	0.504	17	0.535				
	10	73	0.459	20	0.425				
	11	73	5.097	3	0.521				
	12	73	2.413	18	0.787				
	1	74	10.930	27	3.370				
	2	74	2.860	3	3.964	15	2.223		
	3	74	3.851	3	2.696	16	3.370		
470141	4	73	1.206	14	0.606				
	5	73	0.912	6	1.068				
	6	73	0.371	2	0.555				
	7	73	0.153	1	0.201				
	8	73	0.113	25	0.238				
	9	73	0.122	17	0.130				
	10	73	0.110	20	0.102				
	11	73	1.229	2	0.130				
	12	73	0.580	18	0.190				
	1	74	2.631	27	0.813				
	2	74	0.688	3	0.957	15	0.535		
	3	74	0.926	3	0.648	16	0.813		
470151	4	73	1.674	14	0.844				
	5	73	1.263	6	1.481				
	6	73	0.515	2	0.773				
	7	73	0.210	1	0.280				
	8	73	0.159	25	0.331				
	9	73	0.170	17	0.178				
	10	73	0.153	20	0.142				
	11	73	1.708	3	0.173				
	12	73	0.807	18	0.263				
	1	74	3.653	27	1.127				
	2	74	0.954	3	1.328	15	0.742		
	3	74	1.286	3	0.900	16	1.127		

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4701 LAKE BARKLEY

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4701T1	4	73	1.243	14	0.626				
	5	73	0.937	6	1.099				
	6	73	0.382	2	0.569				
	7	73	0.156	1	0.207				
	8	73	0.116	25	0.246				
	9	73	0.125	17	0.133				
	10	73	0.113	20	0.105				
	11	73	1.266	2	0.133				
	12	73	0.597	18	0.195				
	1	74	2.707	27	0.835				
	2	74	0.708	3	0.985	15	0.552		
	3	74	0.954	3	0.668	16	0.835		
4701U1	4	73	1.487	14	0.748				
	5	73	1.121	5	1.645				
	6	73	0.459	15	0.439	30	0.261		
	7	73	0.187						
	8	73	0.142	25	0.0				
	9	73	0.150	17	0.0				
	10	73	0.136	21	0.0				
	11	73	1.515	3	0.0				
	12	73	0.714	18	0.235				
	1	74	3.228	27	1.000				
	2	74	0.847	2	1.172	15	0.660	17	0.620
	3	74	1.141	1	0.878	17	1.195		
4701V1	4	73	-36.812	14	-12.176				
	5	73	148.380	5	210.111				
	6	73	317.149	3	1027.901	30	-336.970		
	7	73	215.774						
	8	73	221.438	25	368.119				
	9	73	198.218	18	220.305				
	10	73	88.349	21	-45.307				
	11	73	286.000	3	481.386				
	12	73	410.594	18	753.228				
	1	74	-122.895	27	141.018				
	2	74	330.458	2	-120.063	17	342.634		
	3	74	202.494	1	399.267	17	220.022		
4701ZZ	4	73	53.802						
	5	73	38.228						
	6	73	17.896						
	7	73	7.759						
	8	73	7.192						
	9	73	3.511						
	10	73	3.511						
	11	73	42.475						
	12	73	26.703						
	1	74	96.277						
	2	74	30.865						
	3	74	35.113						

APPENDIX C

PHYSICAL AND CHEMICAL DATA

STORET RETRIEVAL DATE 76/09/10

470101
37 00 35.0 088 13 05.0 3
LAKE BARKLEY
21143 TENNESSEE

052092

11EPALES 2111202
0069 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/16	10 15	0000	19.6		32	225	8.00	98	0.050	0.500	0.340	0.035
	10 15	0006	19.5	10.2		220	8.10	98	0.040	0.300	0.340	0.033
	10 15	0015	19.4	10.0		220	8.20	98	0.040	0.300	0.340	0.039
	10 15	0040	19.4	10.2		220	8.20	99	0.030	0.300	0.350	0.035
	10 15	0065	19.4	10.1		220	8.10	98	0.040	0.400	0.350	0.037
73/08/14	13 10	0000	28.0		36	163	8.30	62	0.100	0.600	0.140	0.033
	13 10	0005	27.9	6.6		167	8.00	61	0.090	0.400	0.140	0.031
	13 10	0025	27.9	6.5		165	7.90	61	0.110	0.500	0.150	0.034
	13 10	0050	27.7	6.4		168	7.80	61	0.110	0.500	0.150	0.034
	13 10	0070	27.7	6.2		168	7.70	63	0.100	0.400	0.150	0.033
73/10/20	10 30	0000	21.4		28	169	7.40	56	0.060	0.500	0.600	0.056
	10 30	0005	21.3	6.4		169	7.30	54	0.040	0.200K	0.600	0.053
	10 30	0015	21.3	6.4		169	7.30	53	0.040	0.200K	0.580	0.051
	10 30	0025	21.3	6.4		168	7.30	53	0.040	0.200K	0.570	0.048
	10 30	0045	21.2	6.4		166	7.30	53	0.040	0.200K	0.560	0.048
	10 30	0058	21.1	6.2		165	7.30	55	0.050	0.300	0.530	0.045

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/16	10 15	0000	0.102	27.3
	10 15	0006	0.088	
	10 15	0015	0.122	
	10 15	0040	0.105	
	10 15	0065	0.143	
73/08/14	13 10	0000	0.086	17.1
	13 10	0005	0.104	
	13 10	0025	0.142	
	13 10	0050	0.142	
	13 10	0070	0.132	
73/10/20	10 30	0000	0.113	4.5
	10 30	0005	0.105	
	10 30	0015	0.109	
	10 30	0025	0.114	
	10 30	0045	0.115	
	10 30	0058	0.146	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

470102
37 02 26.0 088 07 35.0 3
LAKE BARKLEY
21143 TENNESSEE
052092

11EPALES 2111202
0040 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/16	12 45	0000	19.5		28	225	8.20	98	0.040	0.500	0.360	0.041
	12 45	0006	19.6	10.1		225	8.10	99	0.040	0.300	0.360	0.035
	12 45	0015	19.5	10.0		220	8.10	97	0.040	0.200	0.360	0.035
	12 45	0025	19.5	9.9		225	8.10	97	0.040	0.200	0.360	0.034
	12 45	0035	19.5	10.0		220	8.20	97	0.040	0.300	0.370	0.036
73/08/14	13 55	0000	27.2		34	178	7.80	64	0.080	0.600	0.200	0.037
	13 55	0005	27.1	7.0		178	7.70	65	0.070	0.500	0.210	0.039
	13 55	0025	27.0	6.7		176	7.60	64	0.080	0.400	0.220	0.044
	13 55	0050	26.9	6.4		174	7.50	65	0.110	0.400	0.240	0.040
	13 55	0065	26.9	6.2		174	7.50	65	0.100	0.400	0.240	0.038

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/16	12 45	0000	0.118	29.1
	12 45	0006	0.124	
	12 45	0015	0.100	
	12 45	0025	0.107	
	12 45	0035	0.118	
73/08/14	13 55	0000	0.118	23.3
	13 55	0005	0.112	
	13 55	0025	0.113	
	13 55	0050	0.133	
	13 55	0065	0.146	

STORET RETRIEVAL DATE 76/09/10

470103
37 01 14.0 088 03 28.0 3
LAKE BARKLEY
21143 TENNESSEE

052091

11EPALES 2111202
0070 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 N02&N03 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/16	13 30	0000	19.8		30	215	8.40	98	0.050	0.500	0.300	0.028
	13 30	0005	19.6	10.8		220	8.50	97	0.040	0.400	0.290	0.027
	13 30	0015	19.5	10.4		220	8.30	99	0.040	0.400	0.310	0.029
	13 30	0040	19.4	10.6		220	8.30	89	0.050	0.300	0.290	0.027
	13 30	0064	19.3	10.6		220	8.30	89	0.030	0.200	0.260	0.030
73/10/20	10 00	0000	21.8		20	166	7.40	61	0.040	0.300	0.470	0.063
	10 00	0005	21.8	6.8		167	7.40	59	0.040	0.200K	0.480	0.058
	10 00	0015	21.8	6.6		166	7.40	57	0.040	0.200K	0.470	0.056
	10 00	0035	21.7	7.0		165	7.50	58	0.040	0.300	0.480	0.053
	10 00	0049	21.4	7.2		166	7.80	56	0.050	0.400	0.420	0.046

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/16	13 30	0000	0.085	28.4
	13 30	0005	0.109	
	13 30	0015	0.112	
	13 30	0040	0.113	
	13 30	0064	0.129	
73/10/20	10 00	0000	0.119	9.7
	10 00	0005	0.114	
	10 00	0015	0.106	
	10 00	0035	0.113	
	10 00	0049	0.135	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

470104
36 57 35.0 088 01 35.0 3
LAKE BARKLEY
21143 TENNESSEE

052091

11EPALES 2111202
0072 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/16	14 20	0000	19.5		24	220	8.10	89	0.040	0.400	0.430	0.027
	14 20	0005	19.4	9.3		220	8.10	90	0.040	0.200K	0.440	0.049
	14 20	0015	19.4	9.2		220	8.00	89	0.040	0.200	0.440	0.046
	14 20	0045	19.3	9.2		220	8.00	89	0.040	0.200K	0.460	0.052
	14 20	0068	19.2	8.9		220	7.90	89	0.050	0.200K	0.460	0.047
73/08/14	14 35	0000	26.5		34	171	7.20	65	0.130	0.600	0.320	0.061
	14 35	0005	26.5	6.6		170	7.40	65	0.100	0.300	0.300	0.056
	14 35	0025	26.2	5.8		170	7.30	65	0.130	0.300	0.310	0.057
	14 35	0040	26.2	5.9		170	7.20	65	0.140	0.300	0.320	0.056
	14 35	0065	26.1	6.0		170	7.20	65	0.140	0.200	0.320	0.051

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/16	14 20	0000	0.155	13.0
	14 20	0005	0.125	
	14 20	0015	0.125	
	14 20	0045	0.125	
	14 20	0068	0.136	
73/08/14	14 35	0000	0.128	13.9
	14 35	0005	0.128	
	14 35	0025	0.123	
	14 35	0040	0.130	
	14 35	0065	0.132	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

470105
36 52 31.0 087 58 08.0 3
LAKE BARKLEY
21221 TENNESSEE

052091

11EPALES 2111202
0059 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/16	16 21	0000	19.4		18	220	8.00	84	0.050	0.400	0.440	0.047
	16 21	0004	19.4	9.5		220	8.00	86	0.040	0.200	0.430	0.054
	16 21	0015	19.4	9.2		215	8.00	86	0.040	0.200	0.430	0.052
	16 21	0035	19.3	8.9		220	7.90	85	0.050	0.200	0.460	0.051
	16 21	0055	19.0	12.7		220	7.90	88	0.060	0.200	0.510	0.050
73/10/20	12 35	0000	22.6		29	173	7.40	57	0.050	0.600	0.410	0.074
	12 35	0005	22.3	5.8		172	7.30	56	0.040	0.200K	0.400	0.070
	12 35	0015	22.2	5.8		172	7.40	55	0.050	0.200K	0.390	0.072
	12 35	0030	22.0	4.6		173	7.30	57	0.050	0.200K	0.390	0.063
	12 35	0045	21.7	5.8		172	7.30	61	0.050	0.200K	0.420	0.060
	12 35	0059	21.4	5.8		172	7.30	60	0.050	0.200K	0.430	0.062

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/16	16 21	0000	0.135	18.5
	16 21	0004	0.124	
	16 21	0015	0.129	
	16 21	0035	0.118	
	16 21	0055	0.134	
73/10/20	12 35	0000	0.136	5.5
	12 35	0005	0.128	
	12 35	0015	0.130	
	12 35	0030	0.126	
	12 35	0045	0.133	
	12 35	0059	0.156	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

470106
36 45 55.0 087 57 48.0 3
LAKE BARKLEY
21221 TENNESSEE
052091

11EPALES 2111202
0047 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/17	10 15	0000	18.9		25	219	7.80	80	0.060	0.400	0.400	0.043
	10 15	0006	18.9	9.4		212	7.90	81	0.050	0.300	0.400	0.047
	10 15	0015	18.9	9.1		210	7.80	79	0.050	0.200	0.410	0.042
	10 15	0030	18.9	9.2		214	7.80	80	0.050	0.300	0.410	0.047
	10 15	0044	18.8	9.1		208	7.80	81	0.050	0.300	0.410	0.042
73/08/14	15 00	0000	25.8		29	173	7.20	66	0.170	0.400	0.450	0.083
	15 00	0005	25.8	6.2		173	7.20	67	0.150	0.200	0.450	0.081
	15 00	0025	25.5	5.6		173	7.20	68	0.160	0.200	0.450	0.080
	15 00	0055	25.5	5.9		172	7.20	67	0.160	0.400	0.460	0.070

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/17	10 15	0000	0.126	17.0
	10 15	0006	0.111	
	10 15	0015	0.117	
	10 15	0030	0.127	
	10 15	0044	0.145	
73/08/14	15 00	0000	0.164	5.2
	15 00	0005	0.144	
	15 00	0025	0.143	
	15 00	0055	0.167	

STORET RETRIEVAL DATE 76/09/10

470107
36 41 03.0 087 55 09.0 3
LAKE BARKLEY
21221 TENNESSEE

052092

11EPALES 2111202
0055 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/17	12 55	0000	18.9		24	201	7.70	78	0.060	0.400	0.400	0.042
	12 55	0006	18.8	9.4		201	7.80	78	0.050	0.300	0.400	0.041
	12 55	0015	18.8	9.4		200	7.80	78	0.060	0.200	0.420	0.045
	12 55	0035	18.8	9.4		201	7.90	77	0.050	0.300	0.400	0.040
	12 55	0050	18.8	9.4		200	7.80	78	0.060	0.300	0.400	0.040
73/10/20	13 05	0000	23.7		29	184	7.30	62	0.140	0.500	0.420	0.101
	13 05	0015	23.4	4.8		185	7.20	63	0.130	0.300	0.410	0.091
	13 05	0030	23.3	4.8		182	7.20	62	0.140	0.300	0.400	0.089
	13 05	0048	22.9	5.0		180	7.10	60	0.150	0.200	0.360	0.085

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/17	12 55	0000	0.117	12.4
	12 55	0006	0.119	
	12 55	0015	0.139	
	12 55	0035	0.124	
	12 55	0050	0.128	
73/10/20	13 05	0000	0.162	2.8
	13 05	0015	0.145	
	13 05	0030	0.150	
	13 05	0048	0.149	

STORET RETRIEVAL DATE 76/09/10

470108
36 31 41.0 087 52 12.0 3
LAKE BARKLEY
47161 TENNESSEE

052091

11EPALES 2111202
0055 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/17	13 45	0000	18.5		25	200	7.80	77	0.070	0.500	0.430	0.044
	13 45	0007	18.5	9.4		201	7.70	78	0.070	0.400	0.460	0.043
	13 45	0015	18.4	9.5		201	7.80	77	0.060	0.300	0.430	0.040
	13 45	0030	18.3	9.2		200	7.80	77	0.060	0.300	0.450	0.041
	13 45	0050	18.3	9.2		200	7.80	76	0.060	0.400	0.450	0.039
73/08/14	10 25	0000	25.1		30	175	7.20	64	0.140	0.400	0.440	0.068
	10 25	0005	25.1	6.0		174	7.20	66	0.140	0.300	0.440	0.064
	10 25	0025	25.0	6.0		174	7.20	67	0.140	0.400	0.440	0.062
	10 25	0043	25.0	6.2		174	7.10	66	0.130	0.400	0.440	0.053

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/17	13 45	0000	0.110	10.0
	13 45	0007	0.140	
	13 45	0015	0.105	
	13 45	0030	0.211	
	13 45	0050	0.231	
73/08/14	10 25	0000	0.127	3.2
	10 25	0005	0.107	
	10 25	0025	0.138	
	10 25	0043	0.154	

STORET RETRIEVAL DATE 76/09/10

470109
36 29 05.0 087 44 33.0 3
LAKE BARKLEY
47161 TENNESSEE

052091

11EPALES 2111202
0060 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/17	16 10	0000	17.5		20	199	7.80	74	0.060	0.600	0.450	0.050
	16 10	0006	17.7	9.6		199	7.80	74	0.050	0.500	0.450	0.047
	16 10	0015	17.7	9.4		199	7.80	74	0.040	0.500	0.450	0.046
	16 10	0035	18.0	9.5		200	7.80	77	0.050	0.200	0.450	0.046
	16 10	0055	19.0	8.8		199	7.80	77	0.040	0.300	0.460	0.039
	16 11	0000			20	201	7.70	72	0.060	0.500	0.460	0.044
73/10/20	14 40	0000	24.5		26	183	7.20	58	0.150	0.500	0.360	0.095
	14 40	0005	24.5			184	7.30	56	0.140	0.200K	0.340	0.090
	14 40	0015	24.2	5.6		182	7.20	56	0.140	0.200	0.330	0.091
	14 40	0025	24.2	5.4		183	7.20	55	0.140	0.200K	0.330	0.089
	14 40	0040	24.1	5.4		182	7.30	54	0.140	0.200K	0.360	0.089

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/17	16 10	0000	0.127	9.4
	16 10	0006	0.140	
	16 10	0015	0.169	
	16 10	0035	0.157	
	16 10	0055	0.260	
	16 11	0000	0.127	9.4
73/10/20	14 40	0000	0.159	5.0
	14 40	0005	0.145	
	14 40	0015	0.144	
	14 40	0025	0.160	
	14 40	0040	0.174	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

470110
36 23 41.0 087 39 33.0 3
LAKE BARKLEY
47161 TENNESSEE

052091

11EPALES 2111202
0035 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/17	16 50	0000	17.3			182	7.80	77	0.050	0.300	0.450	0.047
	16 50	0006	18.1	9.4		200	7.80	76	0.050	0.200	0.450	0.043
	16 50	0015	17.6	9.6		200	7.80	76	0.050	0.400	0.450	0.044
	16 50	0030	18.1	9.6		199	7.80	76	0.060	0.300	0.460	0.045
73/08/14	09 45	0000	25.0		18	163	7.10	62	0.150	0.800	0.390	0.063
	09 45	0005	25.0	6.1		164	7.10	63	0.150	0.600	0.400	0.057
	09 45	0015	24.9	6.2		164	7.10	61	0.130	0.600	0.390	0.051
	09 45	0035	24.9	6.3		164	7.10	62	0.130	0.400	0.390	0.040

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/17	16 50	0000	0.136	10.3
	16 50	0006	0.257	
	16 50	0015	0.287	
	16 50	0030	0.300	
73/08/14	09 45	0000	0.132	4.9
	09 45	0005	0.125	
	09 45	0015	0.128	
	09 45	0035	0.153	

APPENDIX D

TRIBUTARY AND WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 76/09/09

4701A1
37 01 50.0 088 13 33.0 4
CUMBERLAND RIVER
47 LYON KY CO MAP
O/LAKE BARKLEY 052092
US 641&62 BRDG 6 MI W OF EDDYVILLE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	13	00	0.399	0.880	0.005K	0.029	0.080
73/05/05	13	00	0.450	2.050	0.052	0.035	0.100
73/06/03			0.390	0.510	0.050	0.044	0.130
73/06/30	13	06	0.273	0.840	0.042	0.033	0.110
73/08/26	13	06	0.105	0.350	0.048	0.037	0.090
73/09/18	13	06	0.220	0.460	0.092	0.044	0.125
73/10/21	13	06	0.560	0.450	0.036	0.055	0.260
73/11/03	12	06	0.400	0.350	0.016		0.135
73/12/17	13	06	0.560	0.300	0.024	0.052	0.110
74/01/26	13	06	0.580	0.100	0.028	0.050	0.158
74/02/02	13	06	0.560	0.800	0.030	0.050	0.150
74/02/17	13	06	0.540	0.600	0.030	0.035	0.100
74/03/01	13	00	0.500	0.400	0.040	0.040	0.155

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4701A2
36 30 15.0 087 22 45.0 4
CUMBERLAND RIVER
47 MONTGOMERY CO MA
I/LAKE BARKLEY 052091
CO RT 13 JUST E OF CUMBERLAND HEIGHTS
11EPALES 211120
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	09	00	0.336	0.270	0.014	0.042	0.115
73/05/06	09	01	0.350	3.000	0.063	0.082	
73/06/01	09	01	0.470	0.590	0.115	0.099	0.220
73/07/01	08	39	0.350	0.370	0.120	0.030	0.135
73/08/26	09	01	0.240	0.230	0.072	0.069	0.125
73/09/18	09	01	0.650	0.420	0.097	0.120	0.200
73/10/20	09	01	0.480	0.350	0.072	0.078	0.120
73/11/02	09	01	0.336	0.550	0.130		0.220
73/12/18	09	01	0.450	0.100	0.056	0.055	0.100
74/01/26	09	00	0.490	0.200	0.028	0.047	
74/02/03	09	01	0.450	0.500	0.025	0.042	0.180
74/02/16	09	01	0.480	1.000	0.040	0.030	0.105
74/03/03	09	00	0.450	0.500	0.035	0.040	0.120

STORET RETRIEVAL DATE 76/09/09

4701d1
37 04 10.0 088 05 30.0 4
UNNAMED STREAM
47 LYON KY CO MAP
T/LAKE BARKLEY 052091
US 24 BRDG NEAR MOUTH IN EDDYVILLE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	12	00	0.023	20.000	12.000	4.200	6.500
73/05/05	12	02	0.390	5.200	2.200	0.570	0.900
73/06/03	12	02	0.023	17.800	12.400		13.300
73/06/30	12	02	0.032	26.000	17.000	10.800	15.000
73/09/19	12	02	0.033	33.000	26.000	14.900	17.000
73/10/21	12	02	0.050	26.000	17.600	20.000	22.000
73/12/17	12	02	0.088	25.000	16.000	10.600	12.000
74/01/26	12	02	0.300	7.500	3.900	2.500	3.850
74/02/03	12	05	0.176	15.000	6.300	2.700	4.500
74/02/17	12	02	0.028	22.000	13.200	11.500	13.200
74/03/01	12	02	0.044	21.000	16.800	6.500	8.050

STORET RETRIEVAL DATE 76/09/09

4701C1
37 02 10.0 087 58 30.0 4
EDDY CREEK
47 LYON KY CO MAP
T/LAKE BARKLEY 052091
SEC RD BRDG 4 MI SE OF SARATOGA
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/06/03			1.600	2.900	0.189		0.345
73/06/30	11	36	0.252	2.940	0.780	0.050	0.210
73/08/26	11	32	1.720	0.100K	0.043	0.330	0.375
73/09/18	11	36	1.500	0.500	0.110	0.470	0.610
73/10/21	11	00	1.580	0.450	0.056	0.420	0.540
73/11/03	11	34	1.680	0.575	0.151		1.200
73/12/17	11	36	2.400	0.300	0.120	0.208	0.260
74/01/26	11	36	2.200	0.300	0.040	0.092	0.125
74/02/02	11	45	2.300	0.400	0.040	0.085	0.150
74/02/17	11	36	0.260	0.400	0.100		0.230
74/03/01	11	32	1.800	0.600	0.108	0.170	0.190

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

470101
36 54 10.0 087 51 50.0 4
MUDDY FORK LITTLE RIVER
47 TRIGG KY CO MAP
T/LAKE BARKLEY 052091
ST RT 778 BRDG 2 MI NW OF CADIZ
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	10	52	1.900	0.730	0.039	0.010	0.040
73/05/05	10	52	0.640	0.770	0.110	0.036	0.125
73/06/03	10	52	1.620	0.740	0.043	0.015	0.070
73/06/30	10	52	0.970	3.600	1.680	0.069	0.185
73/08/26	10	52	0.300	0.660	0.025	0.018	0.060
73/09/18	10	52	0.390	0.600	0.110	0.020	0.062
73/10/21	10	52	0.590	0.350	0.020	0.020	0.045
73/11/03	10	52	0.550	0.950	0.021		0.050
73/12/17	10	52	2.300	0.250	0.038	0.012	0.025
74/01/26	10	56	2.400	0.200	0.028	0.020	0.050
74/02/02	11	32	2.300	1.300	0.045	0.020	0.055
74/02/17	10	52	0.490	0.500	0.050	0.010	0.045
74/03/01	10	52	2.100	0.300	0.050	0.015	0.052

STORET RETRIEVAL DATE 76/09/09

4701E1
36 51 20.0 087 50 30.0 4
LITTLE RIVER
47 TRIGG KY CO MAP
T/LAKE BARKLEY 052091
ST RT 11 BRDG AT SW EDGE OF CADIZ
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	10	27	2.400	0.540	0.019	0.052	0.080
73/05/05	10	27	1.980	3.600	0.730	0.046	0.100
73/06/03	10	27	2.500	0.390	0.050	0.126	0.175
73/06/30	10	27	2.300	1.800	0.530	0.230	0.500
73/08/26	10	27	2.300	0.100K	0.052	0.140	0.180
73/09/18	10	27	1.920	0.595	0.120	0.230	0.300
73/10/21	10	27	1.560	0.700	0.046	0.480	0.720
73/11/03	10	29	1.200	0.850	0.028		0.300
73/12/17	10	27	3.000	0.300	0.024	0.084	0.120
74/01/26	10	27	2.640	0.100K	0.048	0.055	0.090
74/02/02	10	27	2.300	0.600	0.030	0.070	0.170
74/02/17	10	27	0.528	0.400	0.150	0.135	0.135
74/03/01	10	27	2.400	0.400	0.025	0.070	0.110

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4701F1
36 45 00.0 087 54 15.0 4
DONALDSON CREEK
47 TRIGG KY CU MAP
T/LAKE BARKLEY 052091
ST RT 164 BRDG NEAR DONALDSON
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	09	50	0.240	1.890	0.067	0.005K	0.010
73/05/05	09	50	0.252	0.630	0.210	0.005	0.015
73/06/03	09	50	0.420	0.200	0.050	0.014	0.015
73/06/30	09	50	0.520	0.800	0.300	0.010	0.015
73/08/26	09	50	0.310	0.100K	0.017	0.013	0.020
73/09/18	09	50	0.240	0.140	0.037	0.016	0.020
73/10/21	09	50	0.170	0.250	0.023	0.027	
73/11/03	09	50	0.098	0.100K	0.008		0.015
73/12/17	09	50	0.495	0.200	0.012	0.005	0.010
74/01/26	09	50	0.500	0.100K	0.020	0.005K	0.005K
74/02/02	09	50	0.500	0.500	0.020	0.010	0.045
74/02/17	09	50	0.820	0.250	0.040		0.005
74/03/01	09	00	0.240	0.200	0.015	0.005	0.025

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4701G1
36 36 25.0 087 50 18.0 4
SALINE CREEK
47 STEWART CO MAP
T/LAKE BARKLEY 052091
CO RT 120 NEAR BUMPUS MILLS
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	13	26	0.350	1.050	0.080	0.005K	0.025
73/05/06	13	26	0.390	0.170	0.042	0.019	0.020
73/06/02	13	20	0.231	1.600	0.370	0.005K	0.045
73/06/30	17	00	0.040	1.980	0.835	0.010	0.090
73/08/25	13	26	0.070	1.440	0.105	0.015	0.113
73/09/18	13	26	0.022	1.000	0.170	0.010	0.095
73/10/20	13	26	0.084	1.030	0.069	0.009	0.085
73/11/03	13	26	0.085	0.875	0.132		0.092
73/12/17	13	26	0.224	0.500	0.124	0.005K	0.015
74/01/26	13	26	0.540	0.100K	0.032	0.035	0.125
74/02/03	13	26	0.490	0.300	0.050	0.015	0.045
74/02/15	13	26	0.470	0.300	0.010	0.005K	0.060
74/03/03	13	26	0.352	0.400	0.125	0.010	0.025

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4701M1
36 31 35.0 087 48 55.0 4
DYERS CREEK
47 STEWART CO MAP
T/LAKE BARKLEY 052091
US 79 BRDG 3 MI N OF DOVER
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	12 30		0.378	0.480	0.015	0.005K	0.010
73/05/06	12 24		0.600	0.130	0.015	0.005K	0.005K
73/06/02	12 24		0.720	0.180	0.048	0.009	0.010
73/06/30	16 20		0.790	2.500	1.100	0.007	0.015
73/08/25	12 24		0.460	0.100K	0.030	0.010	0.010
73/09/19	12 24		0.420	0.170	0.033	0.010	0.025
73/10/20	12 24		0.480	0.100K	0.016	0.009	0.009
73/11/03	12 24		0.330	0.200	0.027	0.004	0.020
73/12/17	12 24		0.810	0.100K	0.012	0.005	0.009
74/01/26	12 24		0.740	0.100K	0.016	0.010	0.010
74/02/03	12 24		0.650	0.100K	0.020	0.010	0.010
74/02/15	12 24		1.010	0.100K	0.010	0.005K	0.010
74/03/03	12 34		0.540	0.200	0.025	0.010	0.015

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4701J1
36 29 42.0 087 41 55.0 4
FERRY CROSS CREEK
47 STEWART CO MAP
T/LAKE BARKLEY 052091
BANK ALONG GRAVEL RD S OF INDIAN MOUND
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	14	16	0.210	1.050	0.023	0.005K	0.010
73/05/06	14	16	0.360	0.120	0.023	0.006	0.010
73/06/02	14	16	0.450	0.210	0.034	0.007	0.010
73/06/30	17	40	0.510	1.760	0.665	0.007	0.010
73/08/25	14	16	0.400	0.200	0.018	0.008	0.015
73/09/18	14	16	0.336	0.600	0.022	0.011	0.025
73/10/20	14	16	0.336	0.100K	0.022	0.008	0.020
73/11/02	14	16	0.260	0.600	0.017	0.004	0.060
73/12/17	14	16	0.540	0.300	0.016	0.012	0.012
74/01/26	14	16	0.510	0.100	0.016	0.010	0.010
74/02/03	14	16	0.400	0.100K	0.020	0.005K	0.005K
74/02/15	14	16	0.540	0.500	0.005	0.005K	0.005K
74/03/03	14	10	0.288	0.100	0.010	0.010	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4701K1
36 28 50.0 087 31 15.0 4
BLOOMING GROVE CREEK
47 MONTGOMERY CO MA
T/LAKE BARKLEY 052091
BANK ALONG GRAVEL RD 2 MI W DOTSONVILLE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/06/30	18 15		0.450	0.420	0.220	0.010	0.015
73/08/25	15 41		0.024	0.910	0.016	0.010	0.085
73/09/18	15 41		0.090	0.860	0.066	0.027	0.115
73/10/20	15 41		0.154	0.800	0.115	0.024	0.110
73/11/02	15 41		0.200	0.900	0.078	0.024	0.130
73/12/17	15 41		0.450	0.600	0.008	0.012	0.230
74/01/26	15 41		0.534	0.100K	0.008	0.010	0.010
74/02/03	15 41		0.400	0.300	0.030	0.005K	0.005
74/02/15	15 41		0.410	0.100K	0.005K	0.005K	0.005K
74/03/03	15 41		0.216	0.200	0.010	0.010	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4701L1
36 32 40.0 087 22 10.0 4
RED RIVER
47 MONTGOMERY CO MA
T/LAKE BARKLEY 052091
US 41A AT SE EDGE OF NEW PROVIDENCE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	08	40	2.020	0.270	0.039	0.039	0.065
73/05/06	08	34	1.940	0.310	0.058	0.016	0.075
73/06/01	08	39	2.100	3.570	1.020	0.052	0.115
73/07/01	08	39	2.300	0.525	0.115	0.105	0.200
73/08/25	08	39	0.810	0.750	0.290	0.215	0.290
73/09/18	08	39	1.040	0.960	0.470	0.336	0.420
73/10/20	08	39	0.430	0.400	0.090	0.082	0.150
73/11/03	08	34	0.380	0.500	0.140	0.090	0.160
73/12/17	08	39	2.520	0.600	0.084	0.140	0.230
74/01/26	08	39	2.300	0.100K	0.040	0.048	0.075
74/02/03	08	39	2.400	0.100	0.025	0.035	0.075
74/02/16	08	39	0.510	0.400	0.020	0.030	0.100
74/03/03	08	39	2.180	0.400	0.040	0.045	0.110

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4701N1
36 27 04.0 087 26 25.0 4
BUDDS CREEK
47 MONTGOMERY CO MA
T/LAKE BARKLEY 052091
ST HWY 149 BRDG 8 MI SW OF CLARKSVILLE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	09	32	0.210	2.400	0.042	0.005K	0.015
73/05/06	09	35	0.180	0.120	0.005K	0.005K	0.025
73/06/02	09	33	0.310	0.190	0.041	0.015	0.025
73/07/01	09	32	0.231	0.540	0.052	0.016	0.025
73/08/25	09	32	0.190	0.900	0.063	0.025	0.090
73/09/17	09	32	0.132	0.180	0.040	0.022	0.030
73/10/20	09	32	0.026	0.150	0.027	0.017	0.025
73/11/02	09	32	0.022	0.250	0.017	0.012	0.070
73/12/18	09	32	0.288	0.100K	0.028	0.010	0.010
74/01/26	09	30	0.390	0.100K	0.016	0.012	0.015
74/02/03	09	32	0.330	0.400	0.020	0.005	0.050
74/03/03	09	32	0.056	0.100	0.015	0.010	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4701P1
36 24 50.0 087 34 55.0 4
YELLOW CREEK
47 MONTGOMERY CO MA
T/LAKE BARKLEY 052091
CO RT 149 BRDG 3 MI W OF TARSUS
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	10	07	0.110	0.150	0.011	0.005K	0.010
73/05/06	10	07	0.176	1.900	0.060	0.007	0.035
73/06/02	10	07	0.126	0.280	0.031	0.007	0.035
73/07/01	10	07	0.056	0.360	0.024	0.007	0.040
73/08/25	10	07	0.063	0.520	0.018	0.016	0.075
73/09/17	10	07	0.180	0.780	0.025	0.022	0.115
73/10/20	10	04	0.315	0.400	0.073	0.064	0.120
73/11/02	10	07	0.330	0.500	0.160	0.101	0.185
73/12/18	10	07	0.288	0.600	0.072	0.020	0.053
74/01/27	10	07	0.510	0.100K	0.008	0.016	0.016
74/02/03	10	07	0.410	0.100K	0.020	0.020	0.025
74/02/15	10	07	0.300	0.300	0.027	0.005K	0.025
74/03/03	10	07	0.276	0.300	0.035	0.010	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

470101
36 21 17.0 087 40 00.0 4
WELLS CREEK
47 HOUSTON TN CO MA
T/LAKE BARKLEY 052092
GRAVEL RD BRDG OFF CO RT 149 3 MI N ERIN
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	10	40	0.170	0.100K	0.005K	0.018	0.025
73/05/06	10	40	0.250	1.680	0.046	0.018	0.025
73/06/02	10	40	0.294	0.140	0.037	0.039	0.040
73/07/01	10	40	0.360	0.180	0.020	0.042	0.065
73/08/25	10	40	0.270	0.200	0.013	0.048	0.065
73/09/17	10	40	0.260	0.150	0.018	0.076	0.095
73/10/20	10	40	0.270	0.100K	0.028	0.078	0.080
73/11/03	10	40	0.210	0.150	0.013	0.065	0.135
73/12/18	10	40	0.528	0.600	0.036	0.050	0.065
74/01/27	10	40	0.510	0.200	0.016	0.044	0.045
74/02/03	10	40	0.276	0.500	0.020	0.005K	0.020
74/02/15	10	40	0.352	0.100K	0.015	0.035	0.040
74/03/03	10	40	0.224	0.200	0.020	0.032	0.037

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4701R1
36 25 30.0 087 45 25.0 4
S CRUSS CREEK
47 STEWART TN CO MA
T/LAKE BARKLEY 052092
HWY BRDG AT CARLISLE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	11	15	0.058	1.000	0.023	0.005K	0.005K
73/05/06	11	15	0.147	1.890	0.070	0.008	0.015
73/06/02	11	15	0.147	0.290	0.062	0.015	0.025
73/07/01	11	15	0.189	0.180	0.019	0.015	0.040
73/08/25	11	15	0.132	0.140	0.015	0.014	0.017
73/09/17	11	15	0.120	0.160	0.017	0.018	0.025
73/10/20	11	15	0.075	0.100K	0.014	0.012	0.015
73/11/02	11	15	0.092	0.300	0.035	0.017	0.080
73/12/18	11	15	0.276	0.700	0.056	0.020	0.020
74/01/27	11	15	0.470	0.100	0.064	0.016	0.025
74/02/03	11	15	0.168	0.100	0.015	0.005	0.010
74/02/15	11	15	0.250	0.600	0.025	0.005	0.005
74/03/03	11	15	0.152	0.100K	0.015	0.015	0.015

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

470151
36 27 28.0 087 47 57.0 4
LONG CREEK
47 STEWART TN CO MA
T/LAKE BARKLEY 052092
BANK ALONG SEC HWY 4 MI SE OF DOVER
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	11 47		0.071	0.110	0.007	0.005K	0.010
73/05/06	11 47		0.260	1.300	0.037	0.007	0.010
73/06/02	11 47		0.294	0.730	0.105	0.023	0.092
73/07/01	11 47		0.350	0.100K	0.017	0.015	0.025
73/08/25	12 04		0.320	0.190	0.009	0.016	0.025
73/09/17	11 47		0.190	0.140	0.020	0.018	0.025
73/10/20	17 47		0.250	0.150	0.023	0.018	0.018
73/11/03	11 17		0.198	0.150	0.032		0.035
73/12/18	12 40		0.224	0.100K	0.016	0.020	0.025
74/01/27	11 12		0.504	0.300	0.036	0.016	0.020
74/02/03	11 47		0.240	0.300	0.030	0.005	0.010
74/02/15	17 47		0.300	0.500	0.025	0.005	0.005
74/03/03	11 47		0.200	0.300	0.020	0.015	0.015

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4701T1
36 28 10.0 087 49 58.0 4
LICK CREEK
47 STEWART TN CO MA
T/LAKE BARKLEY 052092
BANK AT END OF GRAVEL RD E OF DOVER
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	12	04	0.040	0.780	0.012	0.005K	0.010
73/05/06	12	04	0.138	1.030	0.034	0.007	0.010
73/06/02	12	04	0.176	0.300	0.039	0.016	0.020
73/07/01	12	04	0.240	0.330	0.042	0.022	0.035
73/08/25	12	04	0.147	0.200	0.007	0.017	0.030
73/09/17	12	04	0.126	0.100K	0.017	0.025	0.035
73/10/20	12	04	0.096	0.100K	0.006	0.019	0.020
73/11/02	12	04	0.080	0.100K	0.026	0.020	0.040
73/12/18	11	47	0.224	0.300	0.028	0.020	0.025
74/01/27	12	04	0.320	0.100K	0.044	0.012	0.015
74/02/03	12	04	0.136	0.100	0.015	0.005K	0.005
74/02/15	12	04	0.132	0.100K	0.010	0.005	0.010
74/03/03	12	04	0.044	0.100	0.010	0.015	0.015

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

470101
36 30 25.0 087 53 14.0 4
BEAR CREEK
47 STEWART TN CO MA
T/LAKE BARKLEY 052092
ST HWY 49 BRDG 4 MI NW OF DOVER
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	15	11	0.252	1.150	0.019	0.005K	0.005K
73/05/05	15	11	0.190	0.100K	0.021	0.005K	0.005K
73/06/15	19	00	0.550	2.900	0.098	0.005K	0.010
73/06/30	15	26	0.336	2.100	0.870	0.008	0.010
73/12/18	15	26	0.360	0.100	0.012	0.005	0.012
74/01/27	15	26	0.430	0.100K	0.028	0.008	0.010
74/02/02	15	30	0.240	1.100	0.670	0.005	0.005
74/02/15	15	26	0.192	0.300	0.015	0.005K	0.015
74/02/17	15	26	1.200	0.200	0.012		0.005K
74/03/01	15	26	0.254	0.200	0.015	0.005K	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4701V1
36 59 25.0 088 13 15.0 4
CANAL
47 LYON KY CO MAP
T/LAKE BARKLEY 040892
TRACE RD BRDG 2 MI NNW OF TWIN LAKES
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	13	20	0.450	1.680	0.072	0.037	0.075
73/05/05	13	31	0.410	0.440	0.075	0.042	0.100
73/06/03	13	31	0.410	0.420	0.039	0.058	0.140
73/06/30	13	31	0.330	1.760	1.000	0.029	0.105
73/08/25	13	31	0.040	0.300	0.007	0.013	0.065
73/09/18	13	31	0.210	0.340	0.023	0.034	0.075
73/10/21	13	31	0.310	0.400	0.033	0.050	0.240
73/11/03	13	31	0.310	0.300	0.028	0.034	0.120
73/12/18	13	30	0.450	0.600	0.044	0.060	0.105
74/01/27	13	31	0.610	0.300	0.028	0.048	0.110
74/02/02	13	31	0.580	0.500	0.020	0.045	0.110
74/02/17	13	31	0.640	0.300	0.070	0.030	0.075
74/03/01	13	31	0.504	0.400	0.055	0.040	0.110

STORET RETRIEVAL DATE 76/09/09

4701BA TF4701BA P000900
37 04 20.0 088 05 00.0 4
EDDYVILLE (KENTUCKY)
47 LYON CO HWY MAP
T/BARKLEY LAKE 052091
HAMMOND CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/04/30			0.780	34.000	14.400	7.700	17.300		
73/05/31			1.450	29.000	15.900	8.700	14.500		
73/06/30			0.130	30.000	13.200	14.400	18.800		
73/07/31			0.520	42.000	16.800	6.500	18.000		
73/08/31			0.430		15.100	12.400			
73/10/09	14 30		0.100	34.000	23.000	12.600	27.000		
73/11/12	11 00		0.060	44.000	20.500	9.700	19.500		
74/01/15	10 45		0.840	22.500	2.880	3.800	9.800		
74/03/02	12 20		0.120	31.000	9.500	8.700	18.000		

STORET RETRIEVAL DATE 76/09/09

4701CA TF4701CA P005620
37 05 00.0 087 53 20.0 4
PRINCETON (KENTUCKY)
47 CALDWELL CO HWY
T/BARKLEY LAKE 052091
EDDY CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/04/30	15 00		1.200	14.000	3.700	5.900	7.900	0.690	0.851
73/05/31	15 00		1.070	19.800	9.700	8.830	10.500	0.653	0.634
73/06/30	15 00		2.100	22.000	11.100	11.600	14.000	0.473	0.484
73/07/31	15 00		1.800	21.000	5.800	12.600	17.300	0.449	0.494
73/08/31	15 00			25.200	12.400	15.100		0.490	0.469
73/09/30	15 00		3.600	26.000	14.000	9.100	12.000	0.416	0.441
73/10/31	15 00		2.700	22.000	15.000	11.000	15.000	0.415	0.448
73/11/30	15 00		3.000	9.900	0.092	5.300	8.200	0.865	0.584
73/12/31	15 00		2.100	14.500	0.450	3.900	6.900	0.784	0.555
74/01/31	15 00		1.320	14.000	3.300	6.160	9.000	0.765	0.731
74/02/28	15 00		0.920	13.000	6.400	9.500	11.500	0.450	0.422
74/03/31	15 00		0.640	13.000	2.300	8.200	10.000	0.544	0.526

STORET RETRIEVAL DATE 76/09/09

4701EA AS4701EA P001980
36 51 30.0 087 50 00.0 4
CADIZ (KENTUCKY)
47 TRIGG CO HWY MAP
T/BARKLEY LAKE 052091
LITTLE RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/04/16	11	00							
CP(T)-			0.300	5.100	0.640	17.000	17.300	0.092	0.090
73/04/16	16	00							
73/05/17	11	00							
CP(T)-			0.085	24.000	11.700	12.000	15.700	0.108	0.097
73/05/17	16	00							
73/06/14	11	15							
CP(T)-			0.048	26.700		1.470	16.000	0.096	0.110
73/06/14	15	30							
73/07/16	10	45							
CP(T)-			0.010K	32.000	18.000	6.800	13.500	0.096	0.102
73/07/16	15	50							
73/08/14	10	30							
CP(T)-			0.130	3.200	0.160	4.300	10.500	0.115	0.098
73/08/14	15	30							
73/09/13	11	00							
CP(T)-			0.025	2.600	0.147	16.000	16.000	0.094	0.098
73/09/13	16	05							
73/10/03	10	55	0.060	6.700	0.170		32.000	0.089	0.094
73/11/08	10	55							
CP(T)-			0.420	18.500	8.200	4.400	12.800	0.088	0.092
73/11/08	15	50							
73/12/11	10	55							
CP(T)-			11.600	3.700	0.130	15.000	20.000	0.090	0.094
73/12/11	15	35							
74/01/11	10	30							
CP(T)-			11.200	4.800	0.500	9.900	13.500	0.096	0.092
74/01/11	15	30							
74/02/11	10	55							
CP(T)-								0.088	0.094
74/02/11	15	30							
74/03/11	10	20							
CP(T)-			0.040	11.000	0.067	0.450	12.500	0.112	0.092
74/03/11	15	15							
74/04/11	10	30							
CP(T)-			0.120	2.700	1.400	11.500	15.700	0.089	0.094
74/04/11	15	30							

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

470121 AS470121 P000635
37 04 00.0 088 08 15.0 4
KUTTAWA, KENTUCKEY
47 LAKE BARKLEY
T/LAKE BARKLEY 052092
POPLAR CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/08/31	11	00							
CP(T)-			0.034	45.000			19.000	0.090	0.094
73/08/31	16	00							
73/09/30	11	00							
CP(T)-			0.040	38.000	11.800	20.000	23.000	0.080	0.063
73/09/30	16	00							
73/10/31	11	00							
CP(T)-			0.070	36.000	15.800	17.900	18.000	0.090	0.073
73/10/31	16	00							
73/11/30	11	00							
CP(T)-			0.090	23.000	4.900	8.800	12.500	0.090	0.094
73/11/30	16	00							
73/12/31	11	00							
CP(T)-			0.220	16.000	2.080	6.720	9.100	0.090	0.080
73/12/31	16	00							
74/01/31	11	00							
CP(T)-			0.080	13.000	3.400	4.400	7.200	0.090	0.080
74/01/31	16	00							
74/03/02	11	00							
CP(T)-			0.040	27.000	9.100	13.000	18.000	0.080	0.070
74/03/02	16	00							
74/04/01	11	00							
CP(T)-			0.080	9.000	1.900	3.380	5.800	0.080	0.090
74/04/01	16	00							
74/05/01	11	00							
CP(T)-			0.040	26.000	9.450	10.000	13.000	0.080	0.070
74/05/01	16	00							
74/06/10	11	00							
CP(T)-			0.040	23.000	7.200	6.500	9.480	0.075	0.090
74/06/10	16	00							
74/07/04	11	00							
CP(T)-			0.040	24.000	12.500	12.000	16.500	0.090	0.080
74/07/04	16	00							

APPENDIX E

PARAMETRIC RANKINGS OF LAKES SAMPLED BY NES IN 1974

STATE OF TENNESSEE

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
4701	LAKE BARKLEY	0.128	0.480	473.381	12.723	10.400	0.047
4704	BOONE RESERVOIR	0.052	0.995	442.071	11.415	14.500	0.029
4706	CHEATHAM RESERVOIR	0.142	0.460	473.800	8.160	9.600	0.084
4707	CHEROKEE LAKE	0.051	0.780	448.667	12.162	15.000	0.022
4708	CHICKAMAUGA LAKE	0.031	0.440	463.833	3.111	9.600	0.012
4711	DOUGLAS LAKE	0.026	0.440	442.823	4.553	15.000	0.014
4712	FORT LOUDON RESERVOIR	0.054	0.550	465.571	4.776	12.600	0.025
4713	GREAT FALLS LAKE	0.020	0.405	444.417	3.983	14.800	0.007
4717	NICKAJACK RESERVOIR	0.051	0.495	459.833	2.742	9.700	0.025
4720	OLD HICKORY LAKE	0.058	0.330	469.769	8.931	9.400	0.019
4722	WATTS BAR RESERVOIR	0.032	0.510	462.250	5.550	11.000	0.012
4723	J. PERCY PRIEST RESERVOI	0.056	0.155	430.200	9.993	15.000	0.021
4724	TIM'S FORD RESERVOIR	0.021	0.445	398.167	6.739	14.900	0.009
4725	SOUTH HOLSTON LAKE	0.014	0.570	404.750	7.667	15.000	0.008
4727	REELFOOT LAKE	0.233	0.170	477.917	80.958	13.200	0.059
4728	WOODS RESERVOIR	0.017	0.320	429.083	7.392	15.000	0.005

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P	INDEX NO
4701	LAKE BARKLEY	13 (2)	40 (6)	13 (2)	7 (1)	73 (11)	13 (2)	159
4704	BOONE RESERVOIR	40 (6)	0 (0)	73 (11)	20 (3)	47 (7)	20 (3)	200
4706	CHEATHAM RESERVOIR	7 (1)	47 (7)	7 (1)	40 (6)	90 (13)	0 (0)	191
4707	CHEROKEE LAKE	50 (7)	7 (1)	53 (8)	13 (2)	13 (0)	40 (6)	176
4708	CHICKAMAUGA LAKE	67 (10)	63 (9)	33 (5)	93 (14)	90 (13)	70 (10)	416
4711	DOUGLAS LAKE	73 (11)	63 (9)	67 (10)	80 (12)	13 (0)	60 (9)	356
4712	FORT LOUDON RESERVOIR	33 (5)	20 (3)	27 (4)	73 (11)	60 (9)	27 (4)	240
4713	GREAT FALLS LAKE	87 (13)	73 (11)	60 (9)	87 (13)	40 (6)	93 (14)	440
4717	NICKAJACK RESERVOIR	50 (7)	33 (5)	47 (7)	100 (15)	80 (12)	33 (5)	343
4720	OLD HICKORY LAKE	20 (3)	80 (12)	20 (3)	33 (5)	100 (15)	53 (8)	306
4722	WATTS BAR RESERVOIR	60 (9)	27 (4)	40 (6)	67 (10)	67 (10)	70 (10)	331
4723	J. PERCY PRIEST RESERVOI	27 (4)	100 (15)	80 (12)	27 (4)	13 (0)	47 (7)	294
4724	TIM'S FORD RESERVOIR	80 (12)	53 (8)	100 (15)	60 (9)	33 (5)	80 (12)	406
4725	SOUTH HOLSTON LAKE	100 (15)	13 (2)	93 (14)	47 (7)	13 (0)	87 (13)	353
4727	REELFOOT LAKE	0 (0)	93 (14)	0 (0)	0 (0)	53 (8)	7 (1)	153
4728	WOODS RESERVOIR	93 (14)	87 (13)	87 (13)	53 (8)	13 (0)	100 (15)	433